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1 NAME AND ADDRESS OF THE APPLICANT OR THE REPRESENTATIVE TO WHOM THE CORRESPONDENCE IS TO BE ADDRESSED

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☐ No. assigned by the INPI to the fax

2 NATURE OF THE APPLICATION

Patent application	<input checked="" type="checkbox"/>
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Initial patent application	No. _____ Date ____/____/____
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3 TITLE OF THE INVENTION (200 characters or spaces maximum)

Block polymers and cosmetic compositions comprising such polymers

4 PRIORITY DECLARATION OR APPLICATION FOR THE BENEFIT OF THE FILING DATE OF A PRIOR FRENCH APPLICATION

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7 INVENTOR (S)					
The inventors are the applicants			<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No In this case, provide a separate designation of the inventor(s)		
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The present invention relates to novel polymers of specific structure.

5 The present invention also relates to cosmetic compositions comprising such polymers.

Various types of polymers are conventionally used in cosmetic compositions due to the various properties which they can contribute to these compositions.

10 They are, for example, used in compositions for making up or caring for the skin, lips or superficial body growths, such as nail varnishes or hair compositions. However, on using two incompatible polymers within the same composition, that is to say polymers which are
15 immiscible in the same solvent, the formulator is confronted, due to the incompatibility of the polymers, with problems of separation of phases, indeed even of settling, and generally with a nonhomogeneous composition being obtained. These problems could only
20 be solved to date by the presence in the composition of a compound which makes it possible to render the polymers compatible with one another.

The aim of the present invention is to provide a
25 polymer which, when it is included in a composition, in particular a cosmetic composition, makes it possible for this composition not to exhibit the disadvantages, limitations, failings and drawbacks of the compositions of the prior art.

30 This aim is achieved, in accordance with the present invention, by virtue of a polymer, referred to as a block polymer, comprising at least one first block (or sequence) and at least one second block (or sequence)
35 which are incompatible with one another, the first block having a glass transition temperature (Tg) of between 20 and 40°C and the second block having a glass transition temperature of less than or equal to 20°C or

a glass transition temperature of greater than or equal to 40°C, said first and second blocks being connected to one another via an intermediate segment comprising at least one constituent monomer of the first block and
5 at least one constituent monomer of the second block, said polymer having a polydispersity index I of greater than 2.

"At least" one block is understood to mean one or more
10 blocks.

The intermediate segment comprising at least one constituent monomer of the first block and at least one constituent monomer of the second block of the polymer
15 makes it possible to "compatibilize" these blocks.

When incorporating these novel polymers in cosmetic compositions, the Applicant Company has discovered that some of these polymers, described in more detail below,
20 have highly advantageous cosmetic properties. Generally, these polymers can be incorporated in compositions at a high content of dry matter, typically of greater than 10%, and exhibit ease of formulation. Used in hair products, they improve both the styling
25 power and the suppleness thereof. They increase the impact strength of nail varnishes and improve the hold of a great variety of makeup compositions without causing a feeling of discomfort in the user.

30 Another subject matter of the invention is a cosmetic composition comprising such a polymer.

Another subject matter of the invention is also a cosmetic method for making up or caring for keratinous
35 substances comprising the application, to the keratinous substances, of a cosmetic composition according to the invention.

The invention also relates to the use of the polymer according to the invention in a cosmetic composition as agent for improving the hold of said composition.

5 Finally, the invention relates to the use of the polymer according to the invention in a composition exhibiting improved hold properties.

Specifically, the polymer according to the invention is
10 a linear polymer. This means that the invention is not intended to cover polymers having a nonlinear structure, for example branched, star, grafted or other structure.

15 Preferably, the polymer according to the invention is not water-soluble, that is to say that the polymer, without pH modification, is insoluble in water or in an aqueous solvent at an active material content of at least 1% by weight at ambient temperature (25°C).

20 The polymer according to the invention comprises at least one first block (or sequence) and at least one second block (or sequence) which are incompatible with one another, the first block having a glass transition
25 temperature (T_g) of between 20 and 40°C and the second block having a glass transition temperature of less than or equal to 20°C or a glass transition temperature of greater than or equal to 40°C, said first and second blocks being connected to one another via an
30 intermediate segment comprising at least one constituent monomer of the first block and at least one constituent monomer of the second block, said polymer having a polydispersity index I of greater than 2.

35 The polydispersity index I of the polymer is equal to the ratio of the weight-average molar mass M_w to the number-average molar mass M_n.

The weight-average molar mass (M_w) and the number-average molar mass (M_n) are determined by gel permeation liquid chromatography (solvent THF, calibration curve drawn up with linear polystyrene standards, refractometric detector).

The weight-average molar mass (M_w) of the polymer according to the invention is preferably less than or equal to 150 000; it ranges, for example, from 35 000 to 150 000 and better still from 45 000 to 100 000.

The number-average molar mass (M_n) of the polymer according to the invention is preferably less than or equal to 40 000; it ranges, for example, from 10 000 to 40 000 and better still from 12 000 to 25 000.

Preferably, the polydispersity index of the polymer according to the invention is greater than 2, preferably greater than or equal to 2.5 and better still greater than or equal to 2.8 and in particular between 2.8 and 6.

Method for measuring the glass transition temperature T_g of the polymer

25

The glass transition temperature (T_g) of the polymer is measured by DMTA (Dynamical and Mechanical Temperature Analysis).

In order to measure the glass transition temperature (T_g) of the polymer, viscoelastometry tests are carried out with a TA Instruments Polymer DMTA device (model DMA2980) on a sample of polymer film of approximately $200 \pm 50 \mu\text{m}$ in thickness, 10 mm in width and 15 mm in length, after drying for 7 days on a thermostatically-controlled plate or in a glove box at 30/35°C and $50 \pm 15\%$ relative humidity. A tensile stress is imposed on this sample. The sample is subjected to a static force, for example of 0.01N, on which a sinusoidal

displacement of, for example, $\pm 8 \mu\text{m}$ is superimposed at a frequency of 1 Hz. The operation is thus carried out in the linear region, under low levels of strain. This stress is applied to the sample at temperatures varying
5 from -150°C to $+220^{\circ}\text{C}$, with a variation in temperature of 3°C per minute.

The complex modulus $E^* = E' + iE''$ of the polymer tested is then measured as a function of the temperature. From these measurements, the dynamic storage modulus E'
10 and the dynamic loss modulus E'' are deduced, as well as the damping power: $\text{tg}\delta = E''/E'$.

The curve of the values of $\text{tg}\delta$ as a function of the temperature is then plotted. The glass transition temperature(s) T_g of the polymer correspond(s) to the
15 temperature(s) at which the local maximum is detected on this curve.

When the curve exhibits several peaks, the main T_g value of the polymer tested is taken as being the temperature for which the curve exhibits the peak with
20 the greatest amplitude (that is to say, corresponding to the highest value of $\text{tg}\delta$).

Each block or sequence of the polymer according to the invention results from one type of monomer or from
25 several types of monomers which are different.

This means that each block can be composed of a homopolymer or of a copolymer; it being possible for this copolymer constituting the block to be, in its turn, random or alternating.

30 The intermediate segment comprising at least one constituent monomer of the first block and at least one constituent monomer of the second block of the polymer is itself a random or gradient polymer.

35 The polymer according to the invention comprises at least one first block having a glass transition temperature (T_g) of between 20 and 40°C and at least one second block having a glass transition temperature

of less than or equal to 20°C or a glass transition temperature of greater than or equal to 40°C.

5 The glass transition temperatures indicated for the first and second blocks are theoretical Tg values. They are determined from the theoretical Tg values of the constituent monomers of each of the blocks which can be found in a reference handbook, such as the Polymer Handbook, 3rd ed., 1989, John Wiley, according to the
10 following relationship:

$$1/T_g = \sum_i (\omega_i / T_{g_i}) \quad (\text{Fox's Law})$$

ω_i being the fraction by weight of the monomer i and T_{g_i}
15 being the glass transition temperature of the homopolymer of the monomer i.

The Tg of each of the blocks can also be measured by the DMTA method as defined above, the measurement being
20 carried out on a film of polymer composed of the block in question synthesized under identical conditions. In this case, the corresponding theoretical Tg is equal to the Tg measured by DMTA - 15°C.

Unless otherwise indicated, the Tg values shown for the
25 first and second blocks in the present patent application are theoretical Tg values.

The difference between the glass transition temperatures of the first and second blocks is
30 generally greater than 20°C, preferably greater than 30°C; it is at most +80°C.

Preferably, the proportion of the first block with a Tg of between 20 and 40°C ranges from 10 to 85% by weight of the polymer, better still from 30 to 80% by weight
35 and even better still from 50 to 70% by weight.

The second block can be a block having a Tg of greater than or equal to 40°C, for example a Tg ranging from 40 to 120°C, preferably of greater than or equal to 50°C, for example ranging from 50°C to 150°C, and better still of greater than or equal to 60°C, for example from 60°C to 100°C.

Alternatively, the second block can have a Tg of less than or equal to 20°C, for example from 20 to -80°C, preferably of less than 15°C, in particular ranging from 15°C to -80°C, and better still of less than 10°C, for example ranging from 0°C to -50°C.

The first block, which has a Tg of between 20 and 40°C, is a homopolymer or a copolymer.

In the case where this block is a homopolymer, it results from monomers which are such that the homopolymers prepared from these monomers have glass transition temperatures of between 20 and 40°C. This first block can be a homopolymer composed of just one type of monomer (the Tg of the corresponding homopolymer of which ranges from 20°C to 40°C).

The monomers for which the homopolymers have glass transition temperatures of between 20 and 40°C are preferably chosen from butyl methacrylate, cyclodecyl acrylate, neopentyl acrylate, isodecylacrylamide and their mixtures.

In the case where the first block is a copolymer, it results, in all or in part, from one or more monomers, the nature and the concentration of which are chosen so that the Tg of the resulting copolymer is between 20 and 40°C. The first block can, for example, result, in all or in part, from monomers which are such that the homopolymers prepared from these monomers have Tg values of greater than or equal to 40°C and from monomers which are such that the homopolymers prepared

from these monomers have Tg values of less than or equal to 20°C, as described later, said monomers being chosen so that the Tg of the copolymer forming the first block is between 20 and 40°C.

5 Such monomers are chosen, for example, from methyl methacrylate, isobornyl acrylate, isobornyl methacrylate, trifluoroethyl methacrylate, butyl acrylate, 2-ethylhexyl acrylate and their mixtures.

10 According to a first embodiment, the second block has a Tg of greater than or equal to 40°C and is a homopolymer or a copolymer.

In the case where this second block is a homopolymer,
15 it results from monomers which are such that the homopolymers prepared from these monomers have glass transition temperatures greater than or equal to 40°C. This second block can be a homopolymer composed of just one type of monomer (the Tg of the corresponding
20 homopolymer of which is greater than or equal to 40°C). In the case where the second block is a copolymer, it can result, in all or in part, from one or more monomers, the nature and the concentration of which are chosen so that the Tg of the resulting copolymer is
25 greater than or equal to 40°C. The copolymer can, for example, comprise monomers which are such that the homopolymers prepared from these monomers have Tg values of less than 40°C and which are chosen from the monomers with a Tg of between 20 and 40°C described
30 above and/or the monomers with a Tg of less than 20°C described below.

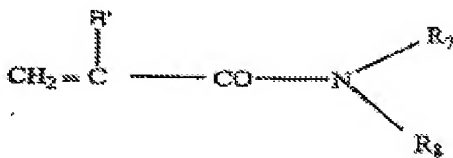
The monomers for which the homopolymers have glass transition temperatures of greater than or equal to
35 40°C are preferably chosen from the following monomers:

- methacrylates of formula $\text{CH}_2=\text{C}(\text{CH}_3)-\text{COOR}_1$

in which R_1 represents a linear or branched alkyl group comprising from 1 to 4 carbon atoms, such as a methyl, ethyl, propyl or isobutyl group, it being possible for said alkyl group in addition to be optionally substituted by one or more substituents chosen from hydroxyl groups and halogen atoms (Cl, Br, I, F), or R_1 represents a C_4 to C_{12} cycloalkyl group,

- acrylates of formula $CH_2=CH-COOR_2$
in which R_2 represents a C_4 to C_{12} cycloalkyl group, such as isobornyl acrylate, or a tert-butyl group,

- (meth)acrylamides of formula:



where R_7 and R_8 , which are identical or different, each represent a hydrogen atom or a linear or branched C_1 to C_{12} alkyl group, such as an n-butyl, t-butyl, isopropyl, isohexyl, isooctyl or isononyl group; or R_7 represents H and R_8 represents a 1,1-dimethyl-3-oxobutyl group; and R' denotes H or methyl. Mention may be made, as examples of monomers, of N-butylacrylamide, N-(t-butyl)acrylamide, N-isopropylacrylamide, N,N-dimethylacrylamide and N,N-dibutylacrylamide,

- styrene and its derivatives, such as chlorostyrene,

- and their mixtures.

Monomers which are particularly preferred are methyl methacrylate, isobutyl methacrylate, isobornyl (meth)acrylate, trifluoroethyl methacrylate, styrene and their mixtures.

5

Preferably, the proportion of the second block with a Tg of greater than or equal to 40°C ranges from 10 to 85% by weight of the polymer, better still from 20 to 70% by weight and even better still from 30 to 70% by weight.

10

According to a second embodiment, the second block can be chosen from blocks with a Tg of less than or equal to 20°C.

15

This second block with a Tg of less than or equal to 20°C is a homopolymer or a copolymer.

In the case where this second block is a homopolymer, it results, in all or in part, from one or more monomers which are such that the homopolymers prepared from these monomers have glass transition temperatures of less than or equal to 20°C. This second block can be a homopolymer composed of just one type of monomer (the Tg of the corresponding homopolymer of which is less than or equal to 20°C).

20

25

In the case where the second block is a copolymer, it can result, in all or in part, from one or more monomers, the nature and the concentration of which are chosen so that the Tg of the resulting copolymer is less than or equal to 20°C.

30

It can, for example, comprise one or more monomers which are such that the homopolymers prepared from these monomers have Tg values of greater than 20°C, such as the monomers described above.

35

The monomers for which the homopolymers have Tg values of less than or equal to 20°C are preferably chosen from the following monomers:

- acrylates of formula $\text{CH}_2=\text{CHCOOR}_3$,

5 R_3 representing a linear or branched C_1 to C_{12} alkyl group with the exception of the tert-butyl group, in which occur(s), optionally intercalated, one or more heteroatoms chosen from O, N and S, it being possible for said alkyl group in addition to be optionally substituted by one or more substituents chosen from hydroxyl groups and halogen atoms (Cl, Br, I and F), or R_3 representing a C_1 to C_{12} alkyl-POE (polyoxyethylene) with repetition of the oxyethylene unit from 5 to 30 times, for example methoxy-POE, or R_3 representing a polyoxyethylene group comprising from 5 to 30 ethylene oxide units;

15 - methacrylates of formula $\text{CH}_2=\text{C}(\text{CH}_3)\text{-COOR}_4$,

R_4 representing a linear or branched C_6 to C_{12} alkyl group, in which occur(s), optionally intercalated, one or more heteroatoms chosen from O, N and S, it being possible for said alkyl group in addition to be optionally substituted by one or more substituents chosen from hydroxyl groups and halogen atoms (Cl, Br, I, F);

- vinyl esters of formula $\text{R}_5\text{-CO-O-CH=CH}_2$,

25 where R_5 represents a linear or branched C_4 to C_{12} alkyl group;

- C_4 to C_{12} alkyl vinyl ethers, such as methyl vinyl ether and ethyl vinyl ether;

30 - N-(C_4 to C_{12} alkyl)acrylamides, such as N-octylacrylamide,

- and their mixtures.

35 The monomers which are particularly preferred for the second block are the alkyl acrylates for which the alkyl chain comprises from 1 to 10 carbon atoms,

with the exception of the tert-butyl group, such as methyl acrylate, isobutyl acrylate, 2-ethylhexyl acrylate and their mixtures.

5 Preferably, the proportion of the second block with a Tg of less than or equal to 40°C ranges from 10 to 85% by weight of the polymer, better still from 20 to 70% by weight and even better still from 20 to 50% by weight.

10

Nevertheless, each of the blocks can comprise, in a minor proportion, at least one constituent monomer of the other block.

15

Thus, the first block can comprise at least one constituent monomer of the second block and vice versa.

20

The first block, which has a glass transition temperature of between 20 and 40°C, and/or the second block, having a glass transition temperature of greater than or equal to 40°C or a glass transition temperature of less than or equal to 20°C, can comprise, in addition to the monomers indicated above, one or more other different monomers referred to as additional monomers.

25

The nature and the amount of this or these additional monomers are preferably chosen so that the block in which they occur has the desired glass transition temperature.

30

This additional monomer is, for example, chosen from:

35

- a) hydrophilic monomers, such as:
 - monomers having ethylenic unsaturation(s) comprising at least one carboxylic or sulfonic acid functional group, such as, for example: acrylic acid, methacrylic acid, crotonic acid, maleic anhydride, itaconic acid, fumaric acid,

maleic acid, styrenesulfonic acid, acrylamidopropanesulfonic acid, vinylbenzoic acid, vinylphosphoric acid and the salts of these,

5 - monomers having ethylenic unsaturation(s) comprising at least one hydroxyl functional group, such as 2-hydroxypropyl methacrylate, 2-hydroxyethyl methacrylate, 2-hydroxypropyl acrylate and 2-hydroxyethyl acrylate,

10 - monomers having ethylenic unsaturation(s) comprising at least one tertiary amine functional group, such as 2-vinylpyridine, 4-vinylpyridine, dimethylaminoethyl methacrylate, diethylaminoethyl methacrylate, 15 dimethylaminopropylmethacrylamide and the salts of these,

b) monomers having ethylenic unsaturation comprising one or more silicon atoms, such as methacryloyloxypropyltrimethoxysilane or methacryloyloxypropyltris(trimethylsiloxy)silane, 20 - and their mixtures.

This or these additional monomer(s) generally represent(s) an amount of less than or equal to 30% by weight, for example from 1 to 30% by weight, preferably 25 from 5 to 20% by weight and more preferably from 7 to 15% by weight of the total weight of the first and/or second blocks.

30 The polymer according to the invention can be obtained by radical polymerization in solution according to the following preparation process:

- a portion of the polymerization solvent is introduced into a suitable reactor and is 35 heated until the temperature appropriate for the polymerization is reached (typically between 60 and 120°C),

- once this temperature is reached, the constituent monomers of the first block are introduced in the presence of a portion of the polymerization initiator,
- 5 - at the end of a time T corresponding to a maximum degree of conversion of 90%, the constituent monomers of the second block and the other portion of the initiator are introduced,
- 10 - the mixture is allowed to react for a time T' (ranging from 3 to 6 h), at the end of which the mixture is brought back to ambient temperature,
- 15 - the polymer is obtained in solution in the polymerization solvent.

The term "polymerization solvent" is understood to mean a solvent or a mixture of solvents. The polymerization solvent can be chosen in particular from ethyl acetate, butyl acetate, alcohols, such as isopropanol or ethanol, aliphatic alkanes, such as isododecane, and their mixtures. Preferably, the polymerization solvent is a butyl acetate and isopropanol mixture or isododecane.

25 The time T corresponds to a degree of conversion of 90%, that is to say to a percentage by weight of constituent monomers of the first block consumed of 90%.

30 The polymerization temperature preferably ranges from 60 to 120°C and preferentially from 80 to 100°C.

35 The polymerization initiator can be chosen from organic peroxides comprising from 8 to 30 carbon atoms; mention may be made, for example, of 2,5-bis(2-ethylhexanoylperoxy)-2,5-dimethylhexane, sold under the reference Trigonox® 141 by Akzo Nobel.

The invention also relates to cosmetic compositions comprising the polymer of specific structure as described above.

5

Generally, these compositions comprise from 0.1 to 60% by weight, preferably from 0.5 to 50% by weight and more preferably from 1 to 40% by weight of the polymer according to the invention.

10

These cosmetic compositions according to the invention comprise, in addition to said polymers, a physiologically acceptable medium, that is to say a medium compatible with keratinous substances, such as the skin, hair, eyelashes, eyebrows and nails.

15

Said physiologically acceptable medium generally comprises an appropriate physiologically acceptable solvent in which the polymer according to the invention occurs in the dissolved or dispersed form.

20

The composition can thus comprise a hydrophilic medium comprising water or a mixture of water and of hydrophilic organic solvent(s), such as alcohols and in particular linear or branched lower monoalcohols having from 2 to 5 carbon atoms, such as ethanol, isopropanol or n-propanol, and polyols, such as glycerol, diglycerol, propylene glycol, sorbitol, pentyleneglycol and polyethylene glycols, or alternatively hydrophilic C₂ ethers and hydrophilic C₂-C₄ aldehydes. When the composition comprises such a hydrophilic medium, the polymer according to the invention then preferably occurs in the form dispersed in said medium.

25

30

35

The water or the mixture of water and of hydrophilic organic solvents can be present in the composition according to the invention in a content ranging from 0.1% to 99% by weight, with respect to the total weight

of the composition, and preferably from 10% to 80% by weight.

5 The composition can comprise, in addition to the block polymer described above according to the invention, an additional polymer, such as a film-forming polymer. According to the present invention, the term "film-forming polymer" is understood to mean a polymer capable of forming, by itself alone or in the presence
10 of an additional agent which is able to form a film, a continuous film which adheres to a support, in particular to keratinous substances.

Mention may be made, among the film-forming polymers which can be used in the composition of the present
15 invention, of synthetic polymers of radical type or of polycondensate type, polymers of natural origin and their blends. Mention may in particular be made, as film-forming polymer, of acrylic polymers, polyurethanes, polyesters, polyamides, polyureas or
20 cellulose polymers, such as nitrocellulose.

The composition can also comprise a fatty phase composed in particular of fatty substances which are liquid at ambient temperature (generally 25°C) and/or
25 of fatty substances which are solid at ambient temperature, such as waxes, pasty fatty substances, gums and their mixtures. These fatty substances can be of animal, vegetable, mineral or synthetic origin. This fatty phase can additionally comprise lipophilic
30 organic solvents.

Mention may be made, as fatty substances which are liquid at ambient temperature, often referred to as oils, which can be used in the invention, of:
hydrocarbon oils of animal origin, such as
35 perhydosqualene; vegetable hydrocarbon oils, such as liquid triglycerides of fatty acids with 4 to 10 carbon atoms, such as triglycerides of heptanoic or octanoic acids, or also sunflower, corn, soybean, grape seed,

sesame, apricot, macadamia, castor or avocado oils, triglycerides of caprylic/capric acids, jojoba oil or shea butter; linear or branched hydrocarbons of mineral or synthetic origin, such as liquid paraffins and their derivatives, liquid petrolatum, polydecenes or hydrogenated polyisobutene, such as parleam; synthetic esters and ethers, in particular of fatty acids, such as, for example, Purcellin oil, isopropyl myristate, 2-ethylhexyl palmitate, 2-octyldodecyl stearate, 2-octyldodecyl erucate or isostearyl isostearate; hydroxylated esters, such as isostearyl lactate, octyl hydroxystearate, octyldodecyl hydroxystearate, diisostearyl malate, triisocetyl citrate or heptanoates, octanoates or decanoates of fatty alcohols; polyol esters, such as propylene glycol dioctanoate, neopentyl glycol diheptanoate, diethylene glycol diisononanoate and pentaerythritol esters; fatty alcohols having from 12 to 26 carbon atoms, such as octyldodecanol, 2-butyloctanol, 2-hexyldecanol, 2-undecylpentadecanol or oleyl alcohol; partially hydrocarbon-comprising and/or silicone-comprising fluorinated oils; silicone oils, such as volatile or nonvolatile and linear or cyclic polymethylsiloxanes (PDMSs) which are liquid or pasty at ambient temperature, such as cyclomethicones, dimethicones, optionally comprising a phenyl group, such as phenyl trimethicones, phenyltrimethylsiloxydiphenylsiloxanes, diphenylmethyldimethyltrisiloxanes, diphenyl dimethicones, phenyl dimethicones, polymethylphenylsiloxanes; and their mixtures.

These oils can be present in a content ranging from 0.01 to 90% by weight and better still from 0.1 to 85% by weight, with respect to the total weight of the composition.

The composition according to the invention can also comprise one or more cosmetically acceptable

(acceptable tolerance, acceptable toxicology and acceptable feel) organic solvents.

These solvents can generally be present in a content ranging from 0 to 90% by weight, preferably from 0.1 to 5 90% by weight, more preferably from 10 to 90% by weight, with respect to the total weight of the composition, and better still from 30 to 90% by weight.

Mention may be made, as solvents which can be used in 10 the composition of the invention, in addition to the hydrophilic organic solvents mentioned above, of ketones which are liquid at ambient temperature, such as methyl ethyl ketone, methyl isobutyl ketone, diisobutyl ketone, isophorone, cyclohexanone or 15 acetone; propylene glycol ethers which are liquid at ambient temperature, such as propylene glycol monomethyl ether, propylene glycol monomethyl ether acetate or dipropylene glycol mono(n-butyl) ether; short-chain esters (having from 3 to 8 carbon atoms in 20 total), such as ethyl acetate, methyl acetate, propyl acetate, n-butyl acetate or isopentyl acetate; ethers which are liquid at ambient temperature, such as diethyl ether, dimethyl ether or dichlorodiethyl ether; alkanes which are liquid at ambient temperature, such as 25 as decane, heptane, dodecane, isododecane or cyclohexane; cyclic aromatic compounds which are liquid at ambient temperature, such as toluene and xylene; aldehydes which are liquid at ambient temperature, such as benzaldehyde or acetaldehyde, and their mixtures.

30 The term "wax" within the meaning of the present invention is understood to mean a lipophilic compound which is solid at ambient temperature (25°C), which exhibits a reversible solid/liquid change in state and 35 which has a melting point of greater than or equal to 30°C which can range up to 120°C.

On bringing the wax to the liquid state (melting), it is possible to render it miscible with oils possibly

present and to form a microscopically homogeneous mixture but, on bringing the temperature back to ambient temperature, recrystallization of the wax in the oils of the mixture is obtained. The melting point
5 of the wax can be measured using a differential scanning calorimeter (DSC), for example the calorimeter sold under the name DSC 30 by Metler.

The wax can also exhibit a hardness ranging from 0.05 MPa to 15 MPa and preferably ranging from 6 MPa to
10 15 MPa. The hardness is determined by the measurement of the compressive force, measured at 20°C using the texture analyzer sold under the name TA-TX2i by Rheo, equipped with a stainless steel cylinder with a diameter of 2 mm which is displaced at the measurement
15 rate of 0.1 mm/s and which penetrates into the wax to a depth of penetration of 0.3 mm.

The waxes can be hydrocarbon, fluorinated and/or silicone waxes and can be of vegetable, mineral, animal and/or synthetic origin. In particular, the waxes
20 exhibit a melting point of greater than 25°C and better still of greater than 45°C.

Mention may be made, as wax which can be used in the composition of the invention, of beeswax, carnauba wax, candelilla wax, paraffin wax, microcrystalline waxes,
25 ceresin or ozokerite; synthetic waxes, such as polyethylene waxes or Fischer-Tropsch waxes, silicone waxes, such as alkyl or alkoxy dimethicones having from 16 to 45 carbon atoms.

30 The gums are generally polydimethylsiloxanes (PDMSs) of high molecular weight or cellulose gums or polysaccharides and the pasty substances are generally hydrocarbon compounds, such as lanolins and their derivatives, or else PDMSs.

35 The nature and the amount of the solid substances depend on the mechanical properties and textures desired. By way of indication, the composition can comprise from 0 to 50% by weight of waxes, with respect

to the total weight of the composition, and better still from 1 to 30% by weight.

The polymer can be used in combination with one or more additional agents which are able to form a film. Such an agent which is able to form a film can be chosen from any compound known to a person skilled in the art as being capable of fulfilling the desired function and can in particular be chosen from plasticizing agents and coalescence agents.

The composition according to the invention can additionally comprise one or more coloring materials chosen from water-soluble dyes and pulverulent coloring materials, such as pigments, pearlescent agents and glitter, well known to a person skilled in the art. The coloring materials can be present in the composition in a content ranging from 0.01% to 50% by weight, with respect to the weight of the composition, preferably from 0.01% to 30% by weight.

The term "pigments" should be understood as meaning white or colored and inorganic or organic particles of any shape which are insoluble in the physiological medium and which are intended to color the composition.

The term "pearlescent agents" should be understood as meaning iridescent particles of any shape produced in particular by certain mollusks in their shells or else synthesized.

The pigments can be white or colored and inorganic and/or organic. Mention may be made, among inorganic pigments, of titanium dioxide, optionally surface-treated, zirconium or cerium oxides, and also zinc, iron (black, yellow or red) or chromium oxides, manganese violet, ultramarine blue, chromium hydrate and ferric blue, or metal powders, such as aluminum powder or copper powder.

Mention may be made, among organic pigments, of carbon

black, pigments of D & C type, and lakes, based on cochineal carmine, of barium, strontium, calcium or aluminum.

5 The pearlescent pigments can be chosen from white pearlescent pigments, such as mica covered with titanium oxide or with bismuth oxychloride, colored pearlescent pigments, such as titanium oxide-coated mica covered with iron oxides, titanium oxide-coated mica covered with in particular ferric blue or chromium
10 oxide, or titanium oxide-coated mica covered with an organic pigment of the abovementioned type, and pearlescent pigments based on bismuth oxychloride. The water-soluble dyes are, for example, beetroot juice or methylene blue.

15 The composition according to the invention can additionally comprise one or more fillers, in particular in a content ranging from 0.01% to 50% by weight, with respect to the total weight of the composition, preferably ranging from 0.01% to 30% by
20 weight. The term "fillers" should be understood as meaning colorless or white and inorganic or synthetic particles of any shape which are insoluble in the medium of the composition, whatever the temperature at which the composition is manufactured. These fillers
25 are used in particular to modify the rheology or the texture of the composition.

The fillers can be inorganic or organic fillers of any shape, platelet, spherical or oblong, whatever the
30 crystallographic form (for example, leaf, cubic, hexagonal, orthorhombic, and the like). Mention may be made of talc, mica, silica, kaolin, polyamide (Nylon®) powders (Orgasol® from Atochem), poly- β -alanine powders, polyethylene powders, powders formed of
35 tetrafluoroethylene polymers (Teflon®), lauroyllysine, starch, boron nitride, polymeric hollow microspheres, such as those of polyvinylidene chloride/acrylonitrile, for example Expancel® (Nobel Industrie),

or of acrylic acid copolymers (Polytrap® from Dow Corning), silicone resin microbeads (Tospearls® from Toshiba, for example), polyorganosiloxane elastomer particles, precipitated calcium carbonate, magnesium carbonate, basic magnesium carbonate, hydroxyapatite, hollow silica microspheres (Silica Beads® from Maprecos), glass or ceramic microcapsules, or metal soaps derived from organic carboxylic acids having from 8 to 22 carbon atoms, preferably from 12 to 18 carbon atoms, for example zinc stearate, magnesium stearate, lithium stearate, zinc laurate or magnesium myristate.

The composition according to the invention can also comprise ingredients commonly used in cosmetics, such as vitamins, thickeners, trace elements, softeners, sequestering agents, fragrances, basifying or acidifying agents, preservatives, sunscreen agents, surfactants, antioxidants, agents for combating hair loss, antidandruff agents, propellants or their mixtures.

Of course, a person skilled in the art will take care to choose this or these optional additional compounds and/or their amounts so that the advantageous properties of the corresponding composition according to the invention are not, or not substantially, detrimentally affected by the envisaged addition.

The composition according to the invention can be provided in particular in the form of a suspension, dispersion, solution, gel, emulsion, in particular oil-in-water (O/W) or water-in-oil (W/O) or multiple (W/O/W or polyol/O/W or O/W/O) emulsion, cream, foam, dispersion of vesicles, in particular of ionic or nonionic lipids, two-phase or multiphase lotion, spray, powder or paste, in particular soft paste (in particular paste having a dynamic viscosity at 25°C of the order of 0.1 to 40 Pa·s under a shear rate of 200 s⁻¹, after measuring for 10 minutes in cone/plate

geometry). The composition can be anhydrous; for example, it can be an anhydrous paste.

5 A person skilled in the art can choose the appropriate dosage form and its method of preparation on the basis of his general knowledge, taking into account, on the one hand, the nature of the constituents used, in particular their solubility in the support, and, on the other hand, the application envisaged for the
10 composition.

The composition according to the invention can be a makeup composition, such as products for the complexion (foundation), face powders, eyeshadows, products for
15 the lips, concealers, blushers, mascaras, eyeliners, products for making up the eyebrows, lip or eye pencils, products for the nails, such as nail varnishes, products for making up the body or products for making up the hair (hair mascara or lacquer).

20 The composition according to the invention can also be a product for caring for the skin of the body and face, in particular an antisen product or a product for coloring the skin (such as a self-tanning product).

25 The composition according to the invention can also be a hair product, in particular for the form retention of the hairstyle or the shaping of the hair. The hair compositions are preferably shampoos, gels, hair setting lotions, blowdrying lotions or fixing and
30 styling compositions, such as lacquers or sprays.

The lotions can be packaged in various forms, in particular in vaporizers or pump-action sprays or in aerosol containers, in order to ensure application of
35 the composition in the vaporized form or in the foam form. Such packaging forms are indicated, for example, when it is desired to obtain a spray or a foam for fixing or treating the hair.

The examples which follow illustrate, without implied limitation, the polymers according to the invention. The amounts are expressed in grams.

5

Example 1: Preparation of a poly(butyl methacrylate/butyl acrylate) polymer

100 g of butyl acetate are introduced into a 1 liter
10 reactor and then the temperature is increased so as to change from ambient temperature (25°C) to 90°C in 1 hour.

210 g of butyl methacrylate, 110 g of butyl acetate and 1.8 g of 2,5-bis(2-ethylhexanoylperoxy)-2,5-dimethylhexane (Trigonox® 141 from Akzo Nobel) are
15 subsequently added at 90°C in 1 hour.

The mixture is maintained at 90°C for 1h 30.

90 g of butyl acrylate, 90 g of isopropanol and 1.2 g of 2,5-bis(2-ethylhexanoylperoxy)-2,5-dimethylhexane
20 are subsequently introduced into the preceding mixture, still at 90°C and in 1 hour.

The mixture is maintained at 90°C for 3 hours and then diluted with 105 g of butyl acetate and 45 g of isopropanol; the combined product is then cooled.

25 A 40% solution of polymer active material in the butyl acetate/isopropanol mixture is obtained.

A polymer is obtained comprising a first polybutyl methacrylate block or sequence having a Tg of 25°C, a
30 second polybutyl acrylate block or sequence having a Tg of -50°C and an intermediate block which is a butyl methacrylate/butyl acrylate random or gradient polymer.

This polymer exhibits a weight-average molar mass of 57 560 and a number-average molar mass of 19 025, i.e.
35 a polydispersity index I of 3.03.

**Example 2: Preparation of a poly(methyl methacrylate/
methyl acrylate/acrylic acid) polymer**

100 g of butyl acetate are introduced into a 1 liter
5 reactor and then the temperature is increased so as to
change from ambient temperature (25°C) to 90°C in
1 hour.

50.4 g of methyl methacrylate, 21 g of acrylic acid,
138.6 g of methyl acrylate, 40 g of butyl acetate, 70 g
10 of isopropanol and 1.8 g of 2,5-bis(2-ethylhexanoyl-
peroxy)-2,5-dimethylhexane (Trigonox® 141 from Akzo
Nobel) are subsequently added at 90°C in 1 hour.

The mixture is maintained at 90°C for 1 hour.

90 g of methyl methacrylate, 70 g of butyl acetate,
15 20 g of isopropanol and 1.2 g of 2,5-bis(2-
ethylhexanoylperoxy)-2,5-dimethylhexane are
subsequently introduced into the preceding mixture,
still at 90°C and in 1 hour.

The mixture is maintained at 90°C for 3 hours and is
20 then diluted with 105 g of butyl acetate and 45 g of
isopropanol; the combined product is then cooled.

A solution comprising 40% of polymer active material in
the butyl acetate/isopropanol mixture is obtained.

25 The polymer obtained comprises a first poly(methyl
acrylate/methyl methacrylate/acrylic acid) block or
sequence having a Tg of 35°C, a second poly(methyl
methacrylate) block or sequence having a Tg of 100°C
and an intermediate block which is a methyl
30 methacrylate/acrylic acid/polymethyl acrylate random
polymer.

**Example 3: Preparation of a poly(isobornyl acrylate/
isobutyl methacrylate/2-ethylhexyl acrylate) polymer**

35

100 g of isododecane are introduced into a 1 liter
reactor and then the temperature is increased so as to

change from ambient temperature (25°C) to 90°C in 1 hour.

105 g of isobornyl acrylate, 50.4 g of isobutyl methacrylate, 54.6 g of 2-ethylhexyl acrylate, 110 g of
5 isododecane and 1.8 g of 2,5-bis(2-ethylhexanoylperoxy)-2,5-dimethylhexane (Trigonox® 141 from Akzo Nobel) are subsequently added at 90°C in 1 hour.

The mixture is maintained at 90°C for 1h 30.

10 90 g of 2-ethylhexyl acrylate, 90 g of isododecane and 1.2 g of 2,5-bis(2-ethylhexanoylperoxy)-2,5-dimethylhexane are subsequently introduced into the preceding mixture, still at 90°C and in 1 hour.

The mixture is maintained at 90°C for 3 hours and then
15 diluted; the combined product is then cooled.

A solution comprising 50% of polymer active material in isododecane is obtained.

The polymer obtained comprises a first poly(isobornyl acrylate/isobutyl methacrylate/2-ethylhexyl acrylate)
20 block or sequence having a Tg of 35°C, a second poly(2-ethylhexyl acrylate) block having a Tg of -50°C and an intermediate block which is an isobornyl acrylate/isobutyl methacrylate/2-ethylhexyl acrylate
25 random polymer.

Example 4: Preparation of a poly(isobornyl acrylate/isobutyl methacrylate/2-ethylhexyl acrylate) polymer

30 100 g of isododecane are introduced into a 1 liter reactor and then the temperature is increased so as to change from ambient temperature (25°C) to 90°C in 1 hour.

54 g of isobornyl acrylate, 75.6 g of isobutyl methacrylate, 50.4 g of 2-ethylhexyl acrylate, 110 g of
35 isododecane and 1.8 g of 2,5-bis(2-ethylhexanoylperoxy)-2,5-dimethylhexane (Trigonox® 141 from Akzo Nobel) are subsequently added at 90°C in 1 hour.

The mixture is maintained at 90°C for 1h 30.

120 g of 2-ethylhexyl acrylate, 90 g of isododecane and 1.2 g of 2,5-bis(2-ethylhexanoylperoxy)-2,5-dimethylhexane are subsequently introduced into the preceding mixture, still at 90°C and in 1 hour.

The mixture is maintained at 90°C for 3 hours and then diluted; the combined product is then cooled.

A solution comprising 50% of polymer active material in isododecane is obtained.

A polymer is obtained comprising a first poly(isobornyl acrylate/isobutyl methacrylate/2-ethylhexyl acrylate) block or sequence having a Tg of 25°C, a second poly(2-ethylhexyl acrylate) block having a Tg of -50°C and an intermediate block which is an isobornyl acrylate/isobutyl methacrylate/2-ethylhexyl acrylate random polymer.

Example 5: Preparation of a poly(isobornyl acrylate/acrylic acid/methyl acrylate) polymer

100 g of isododecane are introduced into a 1 liter reactor and then the temperature is increased so as to change from ambient temperature (25°C) to 90°C in 1 hour.

210 g of isobornyl acrylate, 110 g of isododecane and 1.8 g of 2,5-bis(2-ethylhexanoylperoxy)-2,5-dimethylhexane (Trigonox® 141 from Akzo Nobel) are subsequently added at 90°C in 1 hour.

The mixture is maintained at 90°C for 1h 30.

18 g of isobornyl acrylate, 71.1 g of methyl acrylate, 0.9 g of acrylic acid, 90 g of isododecane and 1.2 g of 2,5-bis(2-ethylhexanoylperoxy)-2,5-dimethylhexane are subsequently introduced into the preceding mixture, still at 90°C and in 1 hour.

The mixture is maintained at 90°C for 3 hours and then diluted; the combined product is then cooled.

A solution comprising 50% of polymer active material in isododecane is obtained.

A polymer is obtained comprising a first poly(isobornyl acrylate/methyl acrylate/acrylic acid) block or sequence having a Tg of 25°C, a second polyisobornyl acrylate block having a Tg of 100°C and an intermediate block which is an isobornyl acrylate/methyl acrylate/acrylic acid random polymer.

Example 6: Nail varnish

A nail varnish was prepared which has the following composition:

Polymer of example 2	23.8 g as AM
Butyl acetate	24.99 g
Isopropanol	10.71 g
Hexylene glycol	2.5 g
DC Red 7 lake	1 g
Hectorite modified with stearyl dimethylbenzylammonium chloride (Bentone® 27V from Elementis)	1.3 g
Ethyl acetate	q.s. for 100 g

After application to the nails, this varnish was considered to exhibit very good properties of hold and of impact strength.

Example 7: Mascara composition

A mascara was prepared which has the following composition:

Beeswax	8 g
Paraffin wax	3 g
Carnauba wax	6 g

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Hectorite modified with distearyl
dimethylbenzylammonium chloride

(Bentone® 38V from Elementis) 5.3 g

Propylene carbonate 1.7 g

5 Filler 1 g

Pigments 5 g

Polymer of example 4 12 g as AM

Isododecane q.s. for 100

10 The hold of the mascara film, after application to the
eyelashes, was considered to be highly satisfactory.

Example 8: Lipstick stick

15 The following lipstick composition is prepared:

Polyethylene wax 15%

Polymer of example 3 10% as AM

20 Hydrogenated polyisobutene (Parleam
from Nippon Oil Fats) 26%

Isododecane q.s. for 100

Pigments 8.6%

25 The composition film obtained after application to the
lips exhibits good hold properties.

Example 9: W/O Foundation

30 A foundation composition is prepared which comprises
the following compounds:

Phase A Cetyl dimethicone copolyol

(Abil EM 90 from Goldschmidt) 3 g

Isostearyl diglyceryl succinate

35 (Imwitor 780K from Condea) 0.6 g

Isododecane 18.5 g

Mixture of pigments (hydrophobic
titanium oxides and iron oxides) 10 g

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		Polymer of example 5	8.7 g as AM
		Polyamide powder (Nylon-12 from DuPont de Nemours)	8 g
		Fragrance	0.5 g
5	Phase B	Water q.s. for	100
		Magnesium sulfate	0.7 g
		Preservative (methylparaben)	0.2 g
	Phase C	Water	2 g
		Preservative (diazolinyl urea)	0.25 g

WHAT IS CLAIMED IS:

1. A polymer comprising at least one first block and
at least one second block which are incompatible with
5 one another, the first block having a glass transition
temperature (Tg) of between 20 and 40°C and at least
one second block having a glass transition temperature
of less than or equal to 20°C or a glass transition
temperature of greater than or equal to 40°C, said
10 first and second blocks being connected to one another
via an intermediate segment comprising at least one
constituent monomer of the first block and at least one
constituent monomer of the second block and said
polymer having a polydispersity index I of greater than
15 2.

2. The polymer as claimed in the preceding claim,
which comprises a polydispersity index of greater than
or equal to 2.5, preferably of greater than or equal to
20 2.8.

3. The polymer as claimed in the preceding claim,
which comprises a polydispersity index of between 2.8
and 6.
25

4. The polymer as claimed in one of the preceding
claims, the weight-average molar mass (Mw) of which is
less than or equal to 150 000.

30 5. The polymer as claimed in one of the preceding
claims, the weight-average molar mass (Mw) of which
ranges from 35 000 to 150 000 and better still from
45 000 to 100 000.

35 6. The polymer as claimed in one of the preceding
claims, the number-average molar mass (Mn) of which is
less than or equal to 40 000.

7. The polymer as claimed in one of the preceding claims, the number-average molar mass (M_n) of which ranges from 10 000 to 40 000 and better still from 12 000 to 25 000.

5

8. The polymer as claimed in one of the preceding claims, which is insoluble at an active material content of at least 1% by weight in water or in an aqueous solvent and at ambient temperature (25°C).

10

9. The polymer as claimed in the preceding claim, wherein the difference between the glass transition temperatures (T_g) of the first and second blocks is greater than 20°C, preferably greater than 30°C.

15

10. The polymer as claimed in one of the preceding claims, wherein the proportion of the first block with a T_g of between 20 and 40°C ranges from 10 to 85% by weight of the polymer, better still from 30 to 80% by weight and even better still from 50 to 70% by weight.

20

11. The polymer as claimed in one of the preceding claims, wherein the first block with a T_g of between 20 and 40°C results, in all or in part, from one or more monomers which are such that the homopolymers prepared from these monomers have glass transition temperatures of between 20 and 40°C.

25

12. The polymer as claimed in any one of claims 1 to 10, wherein the first block with a T_g of between 20 and 40°C results, in all or in part, from monomers which are such that the homopolymers prepared from these monomers have T_g values of greater than or equal to 40°C and from monomers which are such that the homopolymers prepared from these monomers have T_g values of less than or equal to 20°C.

30

35

13. The polymer as claimed in claim 12, wherein the first block with a Tg of between 20 and 40°C results, in all or in part, from monomers chosen from methyl methacrylate, isobornyl acrylate, isobornyl methacrylate, trifluoroethyl methacrylate, butyl acrylate, 2-ethylhexyl acrylate and their mixtures.

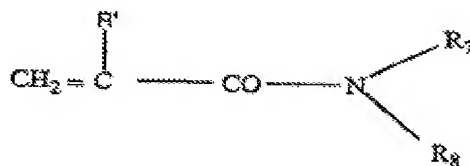
14. The polymer as claimed in any one of the preceding claims, wherein the second block has a Tg of greater than or equal to 40°C and results, in all or in part, from one or more monomers which are such that the homopolymers prepared from these monomers have glass transition temperatures of greater than or equal to 40°C.

15. The polymer as claimed in claim 14, wherein the monomers for which the homopolymers have glass transition temperatures of greater than or equal to 40°C are chosen from the following monomers:

20 - methacrylates of formula $\text{CH}_2=\text{C}(\text{CH}_3)-\text{COOR}_1$
in which R_1 represents a linear or branched alkyl group comprising from 1 to 4 carbon atoms, such as a methyl, ethyl, propyl or isobutyl group, it being possible for said alkyl group in addition to be optionally substituted by one or more substituents chosen from hydroxyl groups and halogen atoms (Cl, Br, I, F), or R_1 represents a C_4 to C_{12} cycloalkyl group,

25 - acrylates of formula $\text{CH}_2=\text{CH}-\text{COOR}_2$
in which R_2 represents a C_4 to C_{12} cycloalkyl group, such as isobornyl acrylate, or a tert-butyl group,

30 - (meth)acrylamides of formula:



where R_7 and R_8 , which are identical or different, each represent a hydrogen atom or a linear or branched alkyl group of 1 to 12 carbon atoms, such as an n-butyl, t-butyl, isopropyl, isohexyl, isooctyl or isononyl group; or R_7 represents H and R_8 represents a

1,1-dimethyl-3-oxobutyl group;

and R' denotes H or methyl,

- styrene and its derivatives, such as chlorostyrene,

10 - and their mixtures.

16. The polymer as claimed in claim 12 or 13, wherein the monomers for which the homopolymers have glass transition temperatures of greater than or equal to

15 40°C are chosen from methyl methacrylate, isobutyl methacrylate, isobornyl (meth)acrylate, trifluoroethyl methacrylate, styrene and their mixtures.

17. The polymer as claimed in one of claims 14 to 16, wherein the proportion of the second block with a Tg of greater than or equal to 40°C ranges from 10 to 85% by weight, preferably from 20 to 70% by weight and better still from 30 to 70% by weight of the polymer.

18. The polymer as claimed in one of claims 1 to 13, wherein the second block has a Tg of less than or equal to 20°C and results, in all or in part, from one or more monomers which are such that the homopolymers prepared from these monomers have glass transition

30 temperatures of less than or equal to 20°C.

19. The polymer as claimed in claim 18, wherein the monomers for which the homopolymers have glass transition temperatures of less than or equal to 20°C are chosen from the following monomers:

- acrylates of formula $CH_2=CHCOOR_3$,

R_3 representing a linear or branched C_1 to C_{12} alkyl group with the exception of the tert-butyl group, in

which occur(s), optionally intercalated, one or more heteroatoms chosen from O, N and S, it being possible for said alkyl group in addition to be optionally substituted by one or more substituents chosen from hydroxyl groups and halogen atoms (Cl, Br, I and F), or R₃ representing a C₁ to C₁₂ alkyl-POE (polyoxyethylene) with repetition of the oxyethylene unit from 5 to 30 times, for example methoxy-POE, or R₃ representing a polyoxyethylene group comprising from 5 to 30 ethylene oxide units;

- methacrylates of formula $\text{CH}_2=\text{C}(\text{CH}_3)-\text{COOR}_4$, R₄ representing a linear or branched C₄ to C₁₂ alkyl group, in which occur(s), optionally intercalated, one or more heteroatoms chosen from O, N and S, it being possible for said alkyl group in addition to be optionally substituted by one or more substituents chosen from hydroxyl groups and halogen atoms (Cl, Br, I, F);

- vinyl esters of formula $\text{R}_5-\text{CO}-\text{O}-\text{CH}=\text{CH}_2$, where R₅ represents a linear or branched C₄ to C₁₂ alkyl group;

- C₄ to C₁₂ alkyl vinyl ethers, such as methyl vinyl ether and ethyl vinyl ether;

- N-(C₄ to C₁₂ alkyl)acrylamides, such as N-octylacrylamide,

- and their mixtures.

20. The polymer as claimed in claim 18 or 19, wherein the monomers for which the homopolymers have glass transition temperatures of less than or equal to 20°C are chosen from alkyl acrylates for which the alkyl chain comprises from 1 to 4 carbon atoms, with the exception of the tert-butyl group.

21. The polymer as claimed in one of the preceding claims, wherein the first block and/or the second block comprises at least one additional monomer.

22. The polymer as claimed in the preceding claim,
wherein the additional monomer is chosen from
hydrophilic monomers, monomers having ethylenic
unsaturation comprising one or more silicon atoms, and
5 their mixtures.

23. The polymer as claimed in claim 21 or 22, wherein
the additional monomer is chosen from:

- 10 - monomers having ethylenic unsaturation(s)
comprising at least one carboxylic or sulfonic
acid functional group
- monomers having ethylenic unsaturation(s)
comprising at least one hydroxyl functional
group
- 15 - monomers having ethylenic unsaturation(s)
comprising at least one tertiary amine
functional group.

24. The polymer as claimed in one of claims 21 to 23,
20 wherein the additional monomer(s) represent(s) from 1
to 30% by weight of the total weight of the first
and/or second blocks.

25. A process for the preparation of a polymer as
25 claimed in one of the preceding claims, which comprises
the following stages:

- 30 - a portion of the polymerization solvent is
introduced into a suitable reactor and is
heated until the temperature appropriate for
the polymerization is reached,
- once this temperature is reached, the
constituent monomers of the first block are
introduced in the presence of polymerization
initiator,
- 35 - at the end of a time T corresponding to a
maximum degree of conversion of 90%, the
constituent monomers of the second block and

the other portion of the polymerization solvent are introduced,

- the mixture is allowed to react for a time T', at the end of which the mixture is cooled,

5 - the polymer is obtained in solution in the polymerization solvent.

26. The process as claimed in the preceding claim, wherein the polymerization temperature is 60-120°C.

10

27. A cosmetic composition, which comprises a polymer as claimed in any one of claims 1 to 24.

28. The cosmetic composition as claimed in the preceding claim, which comprises from 0.1 to 60% by weight, preferably from 0.5 to 50% by weight and more preferably from 1 to 40% by weight of said polymer.

15

29. The composition as claimed in claim 27 or 28, which comprises a physiologically acceptable medium in which the polymer occurs in the soluble or dispersed form.

20

30. The composition as claimed in any one of claims 27 to 29, wherein the physiologically acceptable medium comprises a hydrophilic medium comprising water and mixtures of water and of hydrophilic organic solvent(s), such as alcohols and in particular linear or branched lower monoalcohols having from 2 to 5 carbon atoms, such as ethanol, isopropanol or n-propanol, and polyols, such as glycerol, diglycerol, propylene glycol, sorbitol, pentyleneglycol and polyethylene glycols.

25

30

31. The cosmetic composition as claimed in one of claims 27 to 30, which additionally comprises a fatty phase composed of fatty substances which are liquid or

35

solid at ambient temperature and which are of animal, vegetable, mineral or synthetic origin.

32. The composition as claimed in any one of claims 27
5 to 31, which additionally comprises one or more cosmetically acceptable organic solvents.

33. The cosmetic composition as claimed in any one of
10 claims 27 to 32, which additionally comprises one or more additional agents which are able to form a film chosen from plasticizing agents and coalescence agents.

34. The cosmetic composition as claimed in any one of
15 claims 27 to 33, which additionally comprises one or more coloring materials chosen from water-soluble dyes and pulverulent coloring materials, such as pigments, pearlescent agents and glitter.

35. The composition as claimed in any one of claims 27
20 to 34, which additionally comprises fillers.

36. The cosmetic composition as claimed in any one of
claims 27 to 35, which additionally comprises one or more ingredient(s) chosen from vitamins, thickeners,
25 trace elements, softeners, sequestering agents, fragrances, basifying or acidifying agents, preservatives, sunscreen agents, surfactants, antioxidants, agents for combating hair loss, antidandruff agents, propellants and their mixtures.

30
37. The cosmetic composition as claimed in any one of claims 27 to 36, which is provided in the form of a suspension, dispersion, solution, gel, emulsion, in particular oil-in-water (O/W) or water-in-oil (W/O) or
35 multiple (W/O/W or polyol/O/W or O/W/O) emulsion, cream, foam, dispersion of vesicles, in particular of ionic or nonionic lipids, two-phase or multiphase

lotion, spray, powder or paste, in particular soft paste or anhydrous paste.

5 38. The cosmetic composition as claimed in any one of claims 27 to 37, which is a composition for making up or caring for keratinous substances.

10 39. The cosmetic composition as claimed in any one of claims 27 to 38, which is a hair product, such as a lacquer or a shampoo.

40. The composition as claimed in one of claims 27 to 38, which is a nail varnish.

15 41. The composition as claimed in one of claims 27 to 38, which is a product for making up the lips.

20 42. The composition as claimed in one of claims 27 to 38, which is a product for making up the eyes.

43. The composition as claimed in one of claims 27 to 38, which is a product for making up the complexion.

25 44. A cosmetic method for making up or caring for keratinous substances, which comprises the application, to the keratinous substances, of a cosmetic composition as claimed in one of claims 27 to 43.

30 45. The use of a polymer as claimed in any one of claims 1 to 24 in a cosmetic composition as agent for improving the hold of said composition.

35 46. The use of a polymer as claimed in any one of claims 1 to 24 in a composition exhibiting improved hold properties.